IMPROVING NUTRITIONAL PROFILES THROUGH NPD

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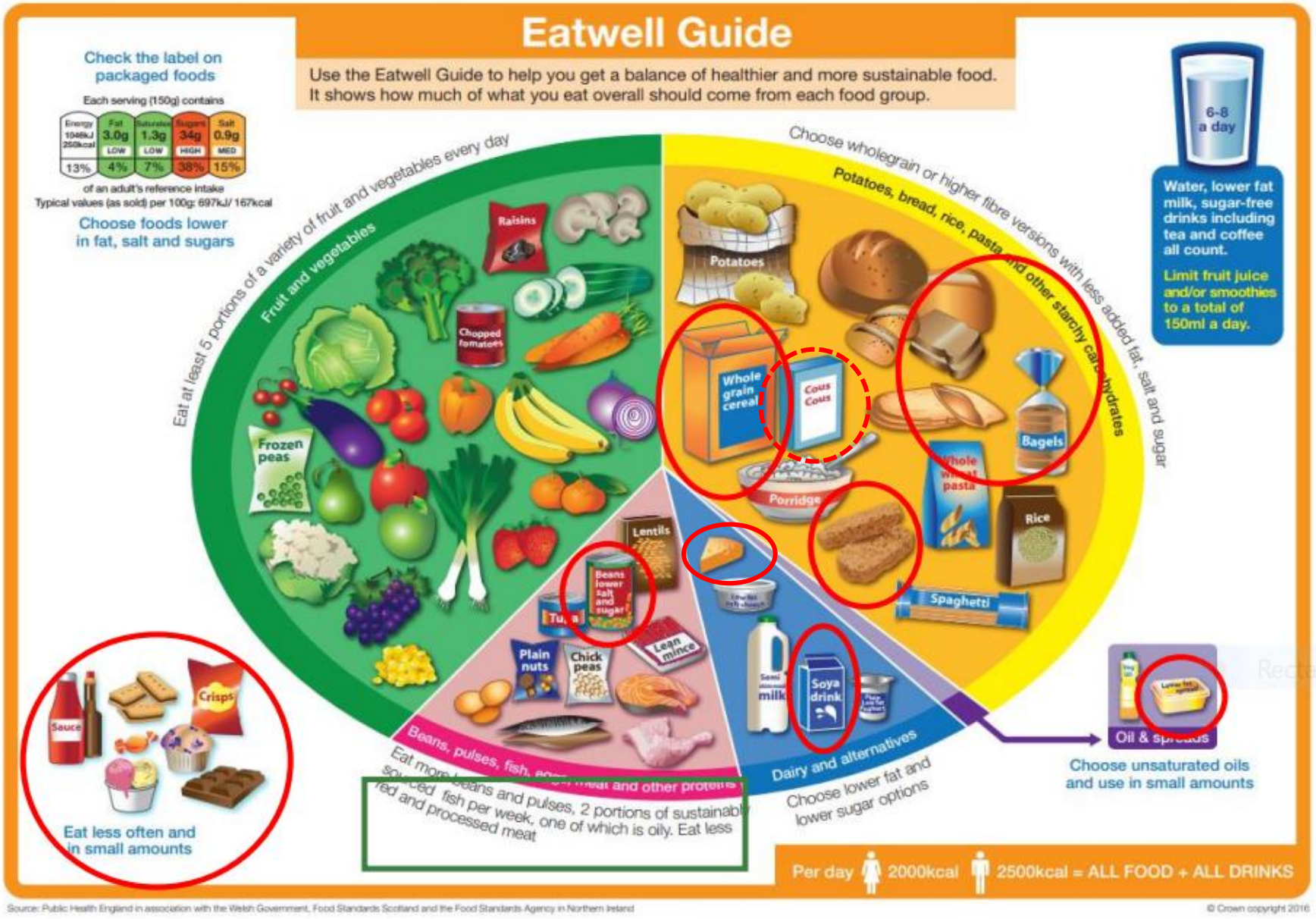
Session Objectives

- Regulations & Guidance
  - Eat well Plate
  - HFSS
  - Sodium Targets
- Difference Home Vs Factory cooking sauces
  - Prep
  - Process
  - Fill
  - Pack
- How can we Utilise Process to Help?
  - Thermal Process
  - Other Process

REGULATIONS & GUIDANCE



The NOVA definition would also include products needed for individuals required to follow a specific diet for medical or nutritional reasons e.g. products suitable for those with coeliac disease, dairy alternatives, meal replacement products for older adults with reduced appetite, infant formula.

HFSS Calculation

	A points				C points		
	Energy KJ	Saturated Fat	Total Sugars	Sodium (mg)	Fruit, Veg, Nuts %	AOAC fibre g per 100g	Protein g per 100g
Value per 100g	1281	4.6	4.5	180	40	3	15
Points	3	4	0	1	0	3	5
Final points	3	4	0	1	0	3	5
Sub-total	8				8		
Total score - autocomplete	0						
Classification	Healthy						

	A points				C points			
	Energy KJ per 100g	Sat Fat g per 100g	Total Sugars g per 100g	Sodium mg per 100g	Fruit, Veg, Nuts %	AOAC fibre g per 100g	Protein g per 100g	Points
≤	335	1	4.5	90	40	0.9	1.6	0
>	335.01	1.001	4.501	90.001	40.0001	0.9001	1.6001	1
>	670.01	2.001	9.001	180.001	60.0001	1.9001	3.2001	2
>	1005.01	3.001	13.501	270.001		2.8001	4.8001	3
>	1340.01	4.001	18.001	360.001		3.7001	6.4001	4
>	1675.01	5.001	22.501	450.001	80.0001	4.7001	8.001	5
>	2010.01	6.001	27.001	540.001				6
>	2345.01	7.001	31.001	630.001				7
>	2680.01	8.001	36.001	720.001				8
>	3015.01	9.001	40.001	810.001				9
>	3350.01	10.001	45.001	900.001				10

The government has introduced restrictions on the promotion, placement, and advertising of HFSS products. These restrictions are intended to reduce children's exposure to HFSS products and help tackle childhood obesity.

FSA 2024 Sodium Targets.

Salt reduction targets for 2024

Main product category	Sub-categories (where relevant)	SALT TARGET FOR 2024 (g salt or mg sodium per 100g)	SALT TARGET FOR 2017 (g salt or mg sodium per 100g)
	14.6 Chilli sauce Includes all chilli and sweet chilli sauce. Also includes Sriracha sauce. Excludes chilli cooking sauce.	2.88g salt or 1150mg sodium (maximum)	New target for 2024
	14.7 Dips Includes all ambient and chilled dips.	0.75g salt or 300mg sodium (average r) 0.9g salt or 360mg sodium (maximum)	New target for 2024
	14.8 All other condiments Includes horseradish, tartare sauce, mint sauce, chutney, seafood sauce.	1.8g salt or 720mg sodium (maximum)	New target for 2024
15. Cook-in and Pasta Sauces, thick sauces and pastes	**15.1 All cook in and pasta sauces (except pesto and other thick sauces and pastes)** Includes all cooking sauces, eg pasta sauce, curry, Mexican, Chinese etc. Excludes thick varieties.	0.68g salt or 270mg sodium (average r) 0.83g salt or 330mg sodium (maximum)	0.75g salt or 300mg sodium (average r) 0.93g salt or 370mg sodium (maximum)
	15.2 Pesto and other thick sauces Includes thick cooking sauces intended to be used in smaller quantities, eg pesto, stir fry sauces, etc. (for example, a portion size of under 90g).	1.3g salt or 520mg sodium (average r) 1.55g salt or 620mg sodium (maximum)	1.38g salt or 550mg sodium (average r) 1.63g salt or 650mg sodium (maximum)
	15.3 Thick pastes Includes all thick pastes used in very small quantities (eg15-20g) such as curry and Thai.	3.09g salt or 1235mg sodium (average r) 3.56g salt or 1425mg sodium (maximum)	3.25g salt or 1300mg sodium (average r) 3.75g salt or 1500mg sodium (maximum)

From 2017: Sodium targets for cooking sauces have fallen 9.3% as an average and 10.7% as a Max level of sodium per 100g of sauce.

<u>2024 targets</u>

Average 0.68g Na or 1.7g NaCl

Maximum: 0.83g Na or 2.1g Nacl

Unfortunately, any natural Sodium will count towards the salt level.

DIFFERENCE HOME VS FACTORY COOKING SAUCES

Kitchen vs Factory made Sauces – No real difference to what we do at home..

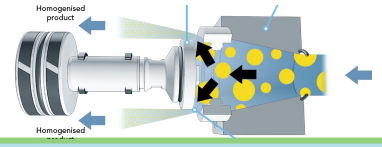
Prep



Similar Ingredients and source.

Simply larger scale and greater use of frozen storage with the factory needing an acidulent for safety if not chilled i.e. Lemon Juice, Citric acid (pH <4.1)

Process

Different Scale, same job.

Home Cook Kitchen pan typically 0.5-1kg
A Factory kettle - 1,500-3,000kg however we still *fry*, boil, simmer. Home cooks can also "emulsify" sauces just for a shorter period.


Fill

Different Scale same Job.

Both fill into jar or Spoon/ladle onto dish. Industrial process maintain temperature for a safe fill.

Pack

Safe shelf life

Processing allows a safe and stable shelf life >12 months Vs a 3 day chilled Home cook life. Some cooks still preserve at home for 12 months.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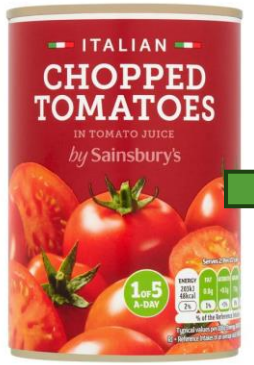

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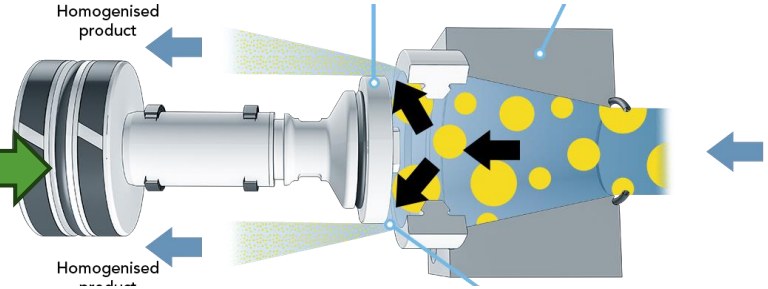

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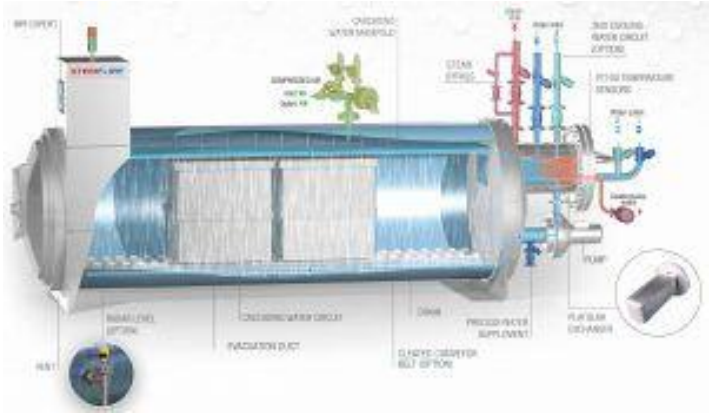


HOW CAN WE UTILISE RECIPE & PROCESS TO HELP?

RECIPE & PROCESS

CIMSCEE

- Calculation based on acetic acid, salt and sugar levels
- Predominantly used for wet products such as table sauces

The CIMSCEE formulae are as follows:

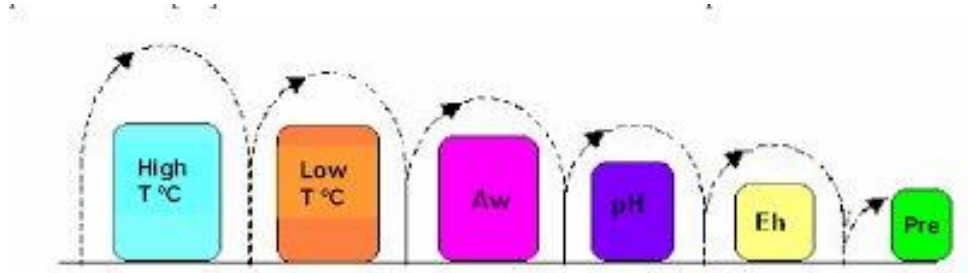
$$15.75\times(1-\alpha)\times(\text{total acetic acid}*\%)+3.08\times(\text{salt}*\%)+(\text{hexose}*\%)+0.5\times(\text{disaccharide}*\%)+40\times(4.0-\text{pH})=\Sigma_s \quad \text{(A.1)}$$

For any sauce based on acetic acid, if the value of Σ_s exceeds 63, safety from microbial pathogens is assured.

$$15.75\times(1-\alpha)\times(\text{total acetic acid}*\%)+3.08\times(\text{salt}*\%)+(\text{hexose}*\%)+0.5\times(\text{disaccharide}*\%)=\Sigma \quad \text{(A.2)}$$

HURDLE TECHNOLOGY

- QC controlled. A mix of product intrinsics & process such as low moisture, heat treatment and pH
- Predominantly used for dry products, such as stock cubes



THERMAL PROCESS

WHAT IS THERMAL PROCESS?

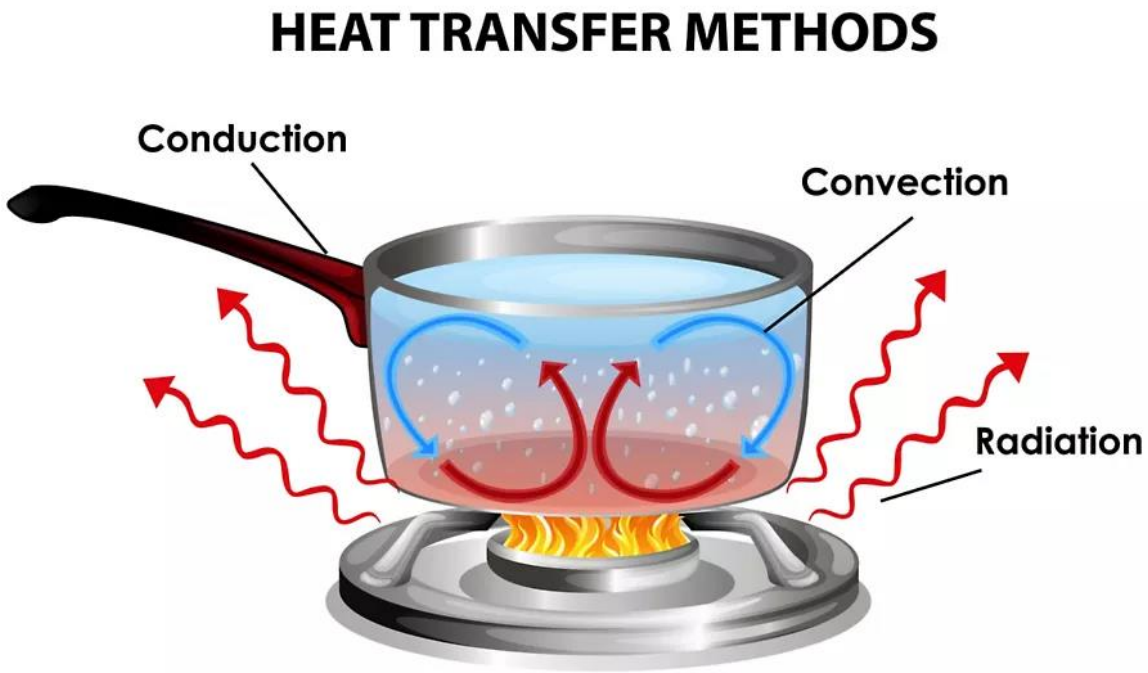
- Preservation (destruction of organisms capable of growth during storage)
- No growth within required shelf-life

Sterilisation

*"- Commercial Sterility of foods – the condition achieved by the **application of heat which renders food free from viable micro-organisms**, including those of known public health significance, capable of growing in the food at the temperatures at which the food is likely to be held during distribution and storage"*

Pasteurisation

*"- any heat treatment which is less than F03 but is designed to **reduce** the numbers of pathogenic and spoilage organisms, and is used in conjunction with **other factors to make foods safe over a designated shelf life**"*



What can impact heat transfer?

Ingredients:

- Size of pieces
- Compactness
- Starchy ingredients
- Thickening agents

Preparation:

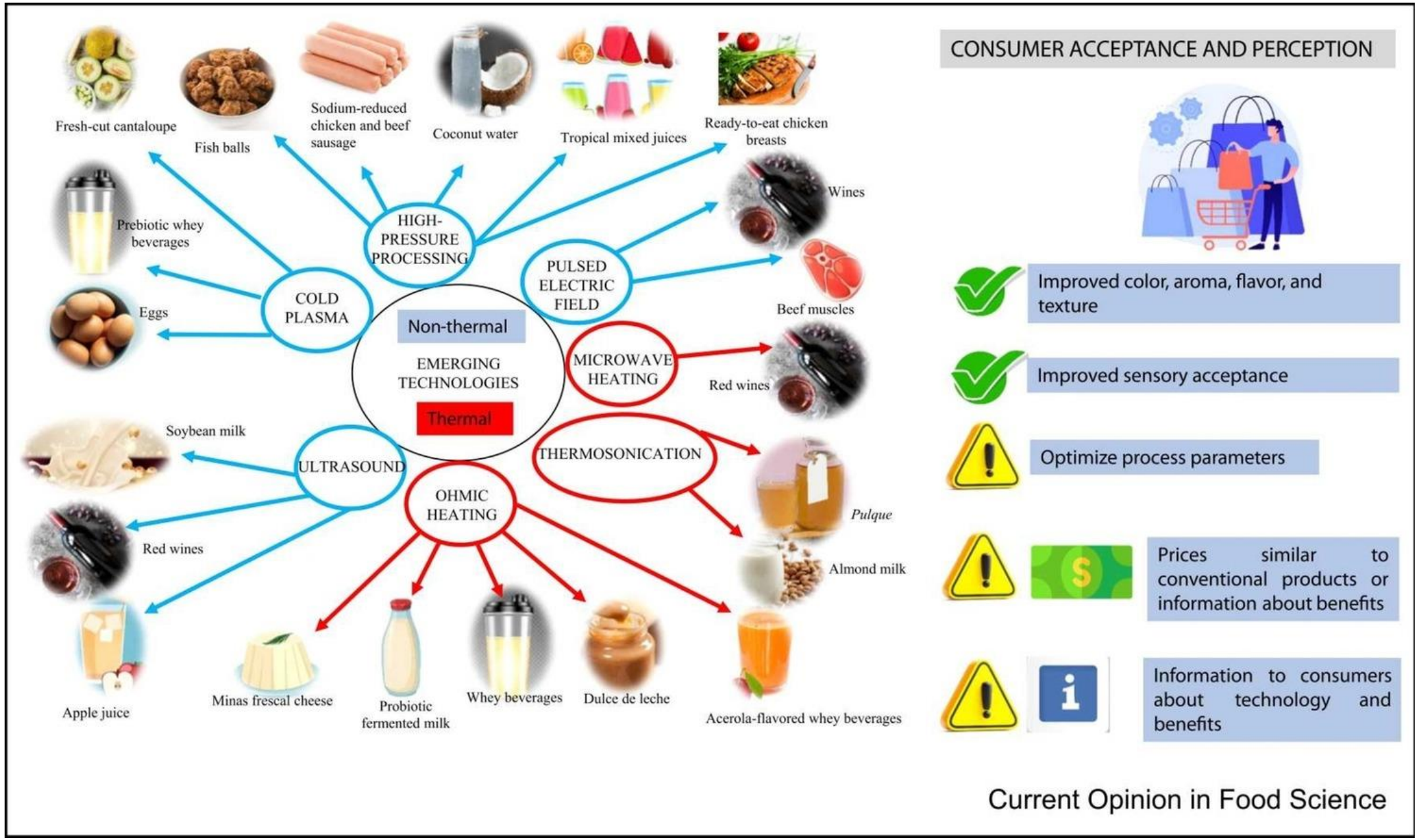
- Rehydration
- Blanching
- De aeration
- Thawing of frozen material

Campden Reference Temperatures / Z Value recommendations

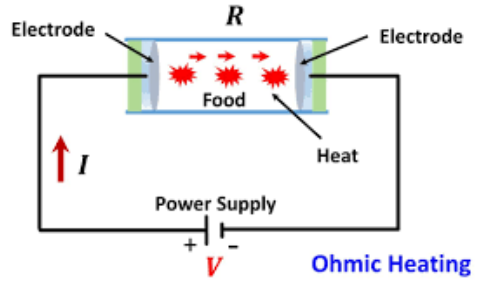
Product pH	Pasteurise / Sterilsation			Notes:
	Fo/P value	Ref. T. °c	Z value °c	
<3.60	10	71*	5*	Pickled products (onions/cabbage)
3.6 – 3.8	5	85	8.3	Hot Fill, Relish / Chutney
3.8 – 4.0				Pickled Beetroot
4.0 – 4.2	5	93.3	8.3	Sauces
>4.5	(3) 6	121.1	10	Sterilised *(Fo value)*

Thermal Process' are determined using the recommendations in the table and can be applied as is or as an equivalent

OTHER OPTIONS


Non-thermal
EMERGING TECHNOLOGIES
Thermal
HIGH-PRESSURE PROCESSING
PULSED ELECTRIC FIELD
COLD PLASMA
MICROWAVE HEATING
THERMOSONICATION
ULTRASOUND
OHMIC HEATING
Fresh-cut cantaloupe
Fish balls
Sodium-reduced chicken and beef sausage
Coconut water
Tropical mixed juices
Ready-to-eat chicken breasts
Wines
Beef muscles
Prebiotic whey beverages
Eggs
Red wines
Pulque
Almond milk
Acerola-flavored whey beverages
Soybean milk
Red wines
Apple juice
Minas frescal cheese
Probiotic fermented milk
Whey beverages
Dulce de leche
CONSUMER ACCEPTANCE AND PERCEPTION
Improved color, aroma, flavor, and texture
Improved sensory acceptance
Optimize process parameters
Prices similar to conventional products or information about benefits
Information to consumers about technology and benefits
Current Opinion in Food Science

Innovate UK



Ohmic Heating

- Advanced Continuous Flow Ohmic Heating for Solid-Liquid Foods: Balancing Quality, Safety, Sustainability, and Intelligent Process Control

- Utilising the conductivity and resistance of the ingredients to heat the sauce

EXPERIMENTAL DESIGN

Let's have a go…..

https://www.bbcgoodfood.com/recipes/tomato-basil-sauce

Recipe

- 2 tbsp olive oil
- 2 garlic clove crushed
- 800g can chopped tomatoes
- 2 tsp vegetable stock powder or 1 crumbled stock cube
- 2 tbsp tomato purée
- few basil leaves

Method

Step 1

- Heat the olive oil in a pan, add the garlic clove, then gently fry for 1 min.

Step 2

- Tip in the chopped tomatoes, vegetable stock powder, tomato purée and 1 tsp sugar, then bring to the boil. Reduce the heat, then simmer uncovered for 5 mins, stirring occasionally.

Step 3

- To finish, tear a few basil leaves, then stir into the sauce.